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tence where a visible image is introduced, the meaning is more or less vitiated to those born blind; and the integrity of the mind, by constantly receiving what it cannot understand, is sadly endangered, unless a wise and assiduous mental culture, peculiarly adapted to those from whom knowledge at one entrance is "quite shut out," accompany every reading in a mixed literature. As yet little philosophy has been brought to bear practically on the education of the blind. There are some exceedingly valuable hints thrown out on this subject in a chapter devoted to "mutes and blind," in the "Retrospect of Western Travel."

If we should receive all that has been written on this subject by benevolent persons it would appear that we have already a literature for the blind, and the blind can now be taught to read and write in three or four lessons. It is much to be regretted that any exaggeration of this kind has ever been mixed up with so good a cause. Time is a necessary element in the education of the blind; and the teacher must be an individual well acquainted with the laws of the human mind. As yet the education of the blind is in the *letter*, the *spirit* is not developed. When we look at the admirable invention of raised tangible characters, we must confess that the *printer* has done his work nobly; but the *schoolmaster* is not yet abroad among the blind. Seeing men have created a suitable literature for themselves; but, for the blind, this literature contains an element of excess which is fatal to intellectual unity.

We may, however, look forward to the time when many splendid results may be expected from the *special* and *philosophical* education of those faculties which the blind often possess in an eminent degree.

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*A Statement of the Number of Seats in the several Churches and Chapels, distinguishing the several Religious Denominations to which they belong, within the Parish of All Saints, Newcastle-upon-Tyne, containing a Population of about* 20,000 *Inhabitants, in the Month of August,* 1838.*

[*Read before the Statistical Section of the British Association, 22nd August,* 1838.]

| Name. | Denomination. | No. of Seats. | | |
|---|---|---|---|---|
| All Saints | Establishment | 1,400 | 1,990 seats in the Established Church. | |
| St. Ann's | Do. | 500 | | |
| Trinity Chapel (Seamen) | Do. | 90 | | |
| Roman Catholic | Roman Catholic | 1,500 | 1,500 | 8,570 seats in Dissenting chapels. |
| Quakers, or | Friends | 500 | 500 | |
| Carliol Street | Presbyterian | 700 | 1,600 | |
| Bethel | Do. | 400 | | |
| Wallkowll | Do. | 500 | | |
| Sandgate | Independent | 200 | 200 | |
| St. Peter's Quay | New Connection, Methodist | 500 | 750 | |
| Ebenezer | Do. Do. | 150 | | |
| Silver Street | Primitive Methodist | 1,100 | 1,250 | |
| Ballast Hills | Do. Do. | 150 | | |
| Gibson Street | Wesleyan Association | 1,200 | 1,200 | |
| Forster Street | Glassites | 120 | 120 | |
| New Road | Wesleyan Methodist | 1,200 | 1,550 | |
| Stepney Bank | Do. Do. | 200 | | |
| St. Lawrence | Do. Do. | 150 | | |
| | | 10,560 | | |

* This table was prepared in consequence of a discussion which arose in the Section, respecting the means of religious worship existing in the parish to which it relates.

## *Statistical Tables of Nine Principal Collieries in the County of Durham.* By W. L. Wharton, Esq., M.A., of Dryburn.

[*Read before the Statistical Section of the British Association, 23rd August,* 1838].

### *Tables of the Engines, Ventilation, Screens, and Sales, &c., and of the Pitmen, and the Strata of Nine Principal Collieries in the County of Durham.*

*The first Eight being situate on the East, or "Dip" Side of the Great Durham Coal-field.*

These Tables have been chiefly drawn from information very obligingly furnished by the principal Agents of each Colliery. The Prices, Sales, &c. are taken from the recently published Parliamentary Report of the London Coal Trade Committee.

| 1.—SITUATION. | 2.—PRINCIPAL PUMPING ENGINES. | | | | |
|---|---|---|---|---|---|
| | | Condensing, or Non-Condensing. | Double or Single, and Diameter of Cylinder. | Length of Stroke in Pit. | Supposed Average Quantity of Water Raised, and from what Depth. (*a*) |
| A. Manor Wallsend Colliery,—distant 16¼ miles (true) N.N.E. from Durham. | A. | Condensing . | 50 in., double . | 7 ft. . . | 49 gals. per minute, 80 fathoms. |
| B. Monkwearmouth Colliery,—distant 12¼ miles N.E. by N. . ,, | B. | Condensing . | 72 in., double . | 8 ft. 4 in. . | 126 gals. ,, 232 ,, |
| C. Newbottle Colliery,—distant 6¼ miles N.E. by N. . . . ,, | C. | Non-Condens. | 46¼ in., double . | 6 ft. . . | 36 gals. ,, 96 ,, |
| D. Littletown Colliery,—distant 3¾ E. by N. . . . . ,, | D. | Non-Condens. | 55¼ in., double (*b*) | 8 ft. . . | 306 gals. ,, 95 ,, |
| E. Hetton Colliery,—distant 6 miles N.E. by E.. . . . . ,, | E. | Condensing*. | 66 in., double . | 5 ft. . . | 156 gals. ,, 110 ,, |
| | | Condensing†. | 78¼ in., double . | 8 ft. 6 in. . | 84 gals. ,, 180 ,, |
| F. South Hetton Colliery,—distant 6¼ miles E.N.E. . . . . ,, | F. | Condensing . | 84 in., double (*b*) | 8 ft. . . | 250 gals. ,, from 30 to 180 fath. |
| G. Haswell Colliery,—distant 6 miles E. . . . . ,, | G. | Condensing . | 69¼ in., double . | 7 ft. . . | 300 gals. ,, 160 ,, |
| H. Thornley Colliery,—distant 5¼ miles E.S.E. . . . . ,, | H. | Non-Condens. | 38 in., double . | 5 ft. . . | 450 gals. ,, 85 ,, |
| I. Blackboy Colliery,—distant 9 miles S. by W. . . . . ,, | I. | Condensing . | 35 in., single . | 7 ft. . . | 300 gals. ,, 40 ,, |

| | 3.—WINDING ENGINES. | | |
|---|---|---|---|
| | Condensing or Non-condensing, and Diameter of Cylinder. | Load upon Pit-rope, and Time of Drawing it. | Valves, &c. |
| A. | 2 condensing—30 and 33 inches . . . . . | 22¼ cwt., 12 feet per second . . . . . | Safety valve. |
| B. | 1 condensing—42 inches . . . . . | 36 cwt., 13¼ feet ,, . . . . . | Safety do.; Scott's Patent Collector. |
| C. | 4 condensing—30, 30, 30, and 35 inches; 1 non-condensing—35 inches | 22¼ cwt., 8 feet ,, . . . . . | Large extra safety valve. |
| D. | 2 condensing—30 and 30 inches; 2 non-condensing—30 and 30 inches | 26 cwt., 20 feet ,, . . . . . | Ditto. |
| E. | 4 condensing*—30, 38½, 38½, and 38¾ inches . . . . . | 33 cwt., 34·3 cwt., and 41·3 cwt., from 11 to 16 feet per second. | Safety valve, lead plugs, Scott's Patent Collector. |
| | 4 non-condensing†—24, 27, 30, and 38½ inches . . . . . | | |
| F. | 2 condensing—42 inches . . . . . | 27 cwt., 18 feet per second. . . . . | Safety ditto. |
| G. | 2 non-condensing—31 inches . . . . . | 39 cwt., 18¼ feet ,, . . . . . | Safety ditto. |
| H. | 2 condensing—42 inches; 2 non-condensing—29 inches. . . . . | 11½ feet ,, . . . . . | Safety valves and lead plugs. |
| I. | 1 condensing—24 inches; 2 non-condensing—14 and 26 inches . . | 15¼ cwt., 5¼ feet ,, . . . . . | Safety do.; Scott's Patent Collector. |

* Eppleton. † Hetton.

## 4.—VENTILATION.

| | Greatest Length of Air Courses (c). | Velocity of Current. |
|---|---|---|
| A. | 9¼ miles . . | From 6 to 10 ft. per sec. |
| B. | 1¼ miles . . | 5 ft. per second in area of 20 feet. |
| E. | From 3 to 11¾ miles. | From 4 to 12¼ feet per second. |
| G. | Mean length, 2 miles. | 15 feet per second in main current. |

## 5.—SCREENS.

| | Distance between Bars. | Small Coal by Screening. | Small Coal Consumed by Engines. | Small Coal left Unsaleable. | Small Coal left in Mine. |
|---|---|---|---|---|---|
| A. | ⅜ inch . . | One-fourth of quantity drawn | 3445 tons per annum . | None . . . . . | None. |
| B. | ¼ inch . . | One-third do. . . . . | 85 tons per week . . | None . . . . . | . . . |
| C. D. | ¼ and ⅝ in. | One-sixth and one-third do. | 52 tons per week . . | None except dust. . | None. |
| E. | ⅝ inch . . | 28 per cent. do. . . . . | 5 per cent. . . . | 1¾ per cent. (*d*) . . | 5 per cent.; in some cases none. |
| F. | ¼ inch . . | One-fourth to one-third do. | . . . | None except dust. . | None. |
| G. | ⅜ to ¼ inch | 29 per cent. do. . . . . | 10 per cent. of small; remainder sold or used by workmen. | Ditto . . . . . | None. |
| H. | ⅜ inch . . | Nearly ¼ (adding refuse) . | . . . | None except dust, amounting to nearly ⅓ of *small* coal. | . . . |
| I. | 7–16 inch . | 25 per cent. of quantity drawn | 60 tons per week . . | . . . | $\frac{1}{200}$ |

## 6.—SALES, &c.

| | Average Shipping Prices (*e*) in 1836. *s.* *d.* | Average Shipping Prices (*e*) in 1837. *s.* *d.* | Tons Sold in London Coal Market in 1837. | Prices, at Coal Market, 1837. May 15. *s.* *d.* | Prices, at Coal Market, 1837. Sept. 15. *s.* *d.* |
|---|---|---|---|---|---|
| A. | 9 9 | .. | 48,005 | 21 0 | .. |
| B. | 9 3 | .. | 16,768 | .. | .. |
| C. | 11 6 | .. | 166,791 | 22 6 | 24 0 |
| D. | 11 6 | .. | 204,668 | 22 9 | 24 0 |
| E. | 11 6 | .. | 121,628 | 22 9 | 23 9 |
| F. | 11 6 | .. | 84,471 | 22 6 | 23 9 |
| G. | 10 4 | 11 6 | 57,774 | 22 6 | 24 0 |
| H. | 10 9 | .. | 65,563 | 22 0 | 23 0 |

## 7.—PITMEN.

| | Particular Diseases, and Working Ages. | Average Earnings (*f*). | Schools and Places of Religious Worship. | Habitations. |
|---|---|---|---|---|
| A. | None.—Work in the pits from the age of 6 to 60 or 70. | 4*s.* per day . . . . . | Church, meeting-houses, and several schools. | Comfortable. |
| B. | None.—To old age . . . | 21*s.* per week. . . . . | Ditto . . . . . | £4. to find house. |
| C. D. | None.—From 7 to 70. . . | 20*s.* to 25*s.* per week; when trade bad, 14*s.* to 15*s.* per week. | Church, meeting-houses, and sunday schools. | House and garden provided. |
| E. | None.—To 65 or 70 . . . | About 3*s.* 7*d.* per day . . | 11 places of worship, and 7 sunday schools.—Population, 5844. | Cottage and garden provided. |
| F. | To 60 or 70 . . . | About 3*s.* 6*d.* per day . . | Chapel of the Established Church, & meeting-houses. | Good house and garden. |
| G. | None.—To an old age . . | 4*s.* per day (11 d. in 14). . | Meeting-house . . . . | Ditto ditto. |
| H. | None.—To 70. "They work longer than agricultural labourers." | Variable; an *old* man may earn from 2*s.* to 2*s.* 8*d.* | Dissenting chapels;—a school established by the proprietors of the colliery. | |
| I. | Rheumatism.—Work to 65 . | 4*s.* per day . . . . . | Various places of worship, 3 sunday schools, and 1 day school, supported by the owners of the colliery. | |

## 8.—STRATA. (*g*)

| | Lime-stone and Red Sand. | Depth from Surface to Main and Hutton Seams, in Fathoms. | Their Thickness of Clean Coal, in Feet. | Magnetic Direction and Angle of Dip. | Direction of Principal "Back," or "Cleat," (*h*) and Headways. | Dykes—their Downcast and Magnetic Bearings. |
|---|---|---|---|---|---|---|
| A. | None . . . . . | 95 and 160 . . . | 4½ and 7 feet . . | S. 65 W.—1 in 12 . | S. 12 E. . . . . | 1 slip dyke, 58 fathoms; S.E. & W. |
| B. | 30 fathoms of lime-stone, and 2 fathoms of sand. | 265 to working seam. (*i*) | 6 feet . . | . . | S. from 10 to 20 E. . . | Strata dislocated on W., N., & E. |
| C. D. | None . . . . . | 96 and 130¾ . . . | 6¼ and 4½ feet . . | S. 55 E.—1 in 54 . | S. 14 E., High Main; S. 85 E., Hutton Seam. | Slip dyke, 21 fathoms N.; S. 80¼ E. |
| E. | *26½ fathoms of lime-stone; no sand † 9½ fathoms of lime-stone, and 18½ of yellow sand . . . . . | 109 and 147½ . 148 and 174½ . | 4¾ and 4½ feet . . | E.—1 in 23 . | S. . . . . | Several slip dykes, from 5 to 12 fathoms, mostly E. and W. |
| F. | 46 fathoms of lime-stone, and 5 fathoms of sand. | 140 and 180. . . | 6½ and 4½ feet . . | E.—1 in 23 . | Indistinct cleat in Hutton Seam. | Inconsiderable. |
| G. | 46½ fathoms of lime-stone, and 8 inches of red sand stone. | 106½ and 152¾ . . | 2¼ and 4½ feet . . | E.—1 in 24 . | S. 45 E. . . . . | Whin dyke, N. 80 W. |
| H. | 25 fathoms of lime-stone, and 6 fathoms of red sand-stone. | 101 and 145. . . | ——— 3¾ feet . . | S.E. . . . | Varies. . . . . | Largest slip dyke, 6 fathoms. |
| I. | None . . . . . | 50 and — feet . . | 5 and — feet . . | S. 21 E. . . . . | S.E. . . . . | Slip dyke, 3½ fathoms. |

* Hetton. † Eppleton.

(*a*) The largest feeders are encountered in sinking the shafts, (amounting occasionally to 2,000 or 3,000 gallons per minute,) and are afterwards "stopped back" by a metal case ("tubbing") fitted to the shaft. The *lowest* feeders of the Monkwearmouth and Manor Wallsend collieries are *salt*. Some copious and valuable salt springs also rise out of the sides of slip and whin dykes in other parts of the county.

(*b*) These are probably the most powerful non-condensing and condensing engines ever erected. There are, however, several *single* pumping engines in Cornwall, furnished with larger cylinders, (3 of 85 inches, and 3 of 90 inches diameter,) the "duty" of which (estimated by the number of lbs. lifted 1 foot high, by the consumption of 1 bushel of coals,) far exceeds the performance of any engines in this district, and in one engine amounts to above 80,000,000 lbs. ! !

(*c*) A Davy lamp, in good order, is supposed by the agents of all these collieries to afford perfect security against fire-damp. The workings of the deepest collieries are frequently carried to an amazing extent *from one shaft*. Several thousand acres of coal are generally held under lease by the proprietors of the largest collieries, the rent being compounded of a "certain" annual rent, and an additional "ten tail" rent for each ten of coals (=18½ Newcastle chaldrons of 53 cwt.) sold beyond the quantity stipulated for the "certain" rent. These ten-tail rents are mostly between 14*s.* and 24*s.* per ten, according to the value of the seams and difficulty of reaching them. The capital required for the establishment of a first-rate sea-sale colliery, including winning, machinery, houses, waggons, &c., is very large, (from 50,000*l.* to upwards of 150,000*l.*)

(*d*) "Of the remaining 21¼ per cent. of small coal, 2 per cent. is consumed by the colliery workmen, and 19¼ per cent. sold."

(*e*) The corresponding prices of coal of inferior quality were from 6*s.* 6*d.* upwards to those given above, which were the highest reported in 1836-7. The corresponding price and sales of 3 of the largest Northumberland collieries, were Killingworth, 11*s.* 6*d.*, 82,699 tons, 21*s.*; Bewicke and Co.'s, 10*s.* 6*d.*, 52,603 tons, 20*s.* 6*d.*; Holywell. 9*s.* 3*d.*, 11*s.*, 52,162 tons, 20*s.* 6*d.*, 21*s.*

(*f*) The earnings necessarily vary with the state of the coal-trade—as it affects each colliery.

(*g*) There are some inconsiderable beds of iron-stone, and some fire-clay in most of these collieries—the former not worth working.

(*h*) This "back," or cleat, is a parallel and vertical cleavage of the coal, of which the pitmen universally avail themselves in their principal excavations (called "boards,") which are "driven" perpendicularly to it. The narrow passages used for travelling and air courses (called headways or endings) being parallel to the cleavage. There is generally a considerable uniformity in its direction throughout large districts of the coal-field—but occasionally variations occur in the same colliery, and in superincumbent seams.

(*i*) The workings extend from 10 to 14 fathoms *below* this depth, in consequence of downcast dykes and the declination of the seam—and the natural temperature of the strata contiguous to the lowest workings is reported to exceed 76° Fahrenheit.